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TAX WRITEOFFS AND THE VALUE OF SPORTS TEAMS

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It is by now common knowledge that ownership of a professional sports team carries with it certain tax advantages. In a recent paper, Okner (3) has discussed the nature of these advantages. The purpose of the present paper is to explore the implications of such tax advantages for the cash flow position of an owner of a sports team, and for the market price of the team. A simplified model of valuation of a team is described, and the conclusions derived from this model are compared with empirical observations concerning market prices of sports teams.

The potentialities of special tax treatment from ownership of a sports team were apparently first discovered by Bill Veeck in 1959 when he was in the process of purchasing the Chicago White Sox (5, 6). As it turned out, however, Veeck was not able to acquire a sufficiently large fraction of the White Sox' stock to actually take advantage of his discovery. Since that time, various IRS rulings have clarified the tax advantage, and owners of sports teams have made widespread use of the tax benefits from ownership. At the present time, the attitude of the IRS is changing, and it might well be the case that the era of special tax advantages is near its end, so far as professional sports is concerned.

To explain the tax advantages associated with ownership of a sports team, some comments are necessary concerning the balance sheet of the team. The assets of any sports team consist largely of intangibles, with tangible assets representing only a negligible fraction of the team's

book value. Intangible assets of a team include the team's league franchise; providing exclusive rights to the exhibition of league games within a specified geographic area (generally defined in terms of a twenty-five to seventy-five mile radius about the home stadium of the team); an equal sharing with other league teams in the proceeds of the league's national TV contract; an equal sharing with other league teams in entry fees paid to the league by expansion teams; participation in the annual league draft of newly recruited players; and protection within the league of the team's rights to "reserved" players, that is, players regarded as the team's property so far as the league is concerned. In contrast, for most sports teams, tangible assets are represented only by office furniture and supplies, together with uniforms and other playing equipment.

When a sports team is purchased, the purchase price becomes the measure of the total value of the tangible and intangible assets held by the team. At time of purchase, the new owner makes an assignment of this purchase price among the various assets of the team. For tangible assets, valuation is no particular problem, since the accounting rule "lower of cost (less depreciation) or market" can be applied in a straightforward manner. But for the intangible assets, there are real difficulties in arriving at non-arbitrary valuations of individual intangible assets, because of the "joint product" nature of these assets. It is in the valuation of the intangible assets of the team that tax advantages arise.

Current IRS rulings hold that the player contracts held by a team at time of purchase can be treated as depreciable assets, which can be written off over the expected playing lifetime of the players. Other intangible assets such as the franchise, TV contract, etc., have generally been regarded by the IRS as non-depreciable. It should also be pointed out that the IRS permits a team to write off as current expenses certain of the costs associated with replacing players, such as losses

of minor league affiliates, training camps, scouting activities, etc. Bonuses paid to drafted players and payments made in purchase of players from other teams must be capitalized and written off over the expected playing lifetimes of such players.

Depreciation of player contracts held by the team at time of purchase is thus a non-cash cost of the team that reduces the team's taxable income over the period during which such player contracts are being written off. Once the player contracts have been completely depreciated, there are no special tax advantages from ownership of the team. But the owner is now free to sell the team to someone else, who can now go through the same process.* In this sense, the tax benefits

* At time of sale, the existing owner pays capital gains tax on the difference between the sales price of the team and the cost basis of the assets of the team (for player contracts, original value less accumulated depreciation). In addition, the existing owner must pay ordinary income taxes on any recapture of excess depreciation, that is, on the difference between the purchase price assigned to any player contract and its book value. Hence, at time of sale, the incentives work towards as low a valuation as possible for player contracts on the part of the seller, and as high a valuation as possible to player contracts on the part of the buyer. Both of these assignments, of course, are subject to IRS scrutiny, but in practice it appears that the IRS has been willing to accept different valuations by buyers and sellers. See Sporting News (August 17, 1974).

from team ownership are perpetual.

Clearly there are important incentives present for the purchaser of a sports team to assign as large a value as possible to the playing contracts owned by a team, and as low a value as possible to the non-depreciable intangible assets of the team. This is reflected in the usual practice with respect to expansion teams, where the entry fee charged the team is typically divided between a nominal sum charged for the franchise, with the great bulk of the purchase price assigned to the players whose contracts are purchased by the expansion team from

existing teams in the league. For example, when Atlanta was admitted to the NFL for the 1966 season, the entry fee was \$8,500,000 -- \$50,000 for the NFL franchise, and \$8,450,000 for the forty-two players Atlanta was permitted to draft from the rosters of the fourteen NFL teams. The implicit value of \$200,000 plus per drafted player applied to individuals who must be regarded as somewhat marginal, since each NFL team was permitted to exempt twenty-nine of the forty-two players on its roster from the Atlanta draft. Beyond this, Atlanta could draft at most three players from any one NFL team.

This raises the question of the "true" value that should be assigned to any given player contract owned by a team. From the economist's point of view, such a contract is worth the discounted present value of profits that accrue to the owner of the contract. Thus if a given player has an expected playing lifetime of T years, if he adds MR_t dollars to revenue in year t , and if his salary in year t is w_t , then the value, V , of the contract at time zero is given by

$$V = \sum_{t=1}^T \frac{MR_t - w_t}{(1 + d)^t}$$

where d is the rate of discount.

(Strictly speaking, the appropriate value for MR_t is that associated with the team in the league that has the highest such value so far as the player is concerned, since the team owning the contract maximizes profits from ownership of the contract by selling it to the team with the highest MR_t , assuming that the market for player contracts operates competitively.)

In principle at least, marginal revenue (MR_t) can be calculated on a player by player basis to determine for any team what the "true" value of its holdings of player contracts is. Actual calculations have been

made for baseball by Scully (4), and for certain basketball players by Noll (2). For sports like football where team performance rather than individual performance is the dominating feature of the game, calculations of marginal revenues of individual players are particularly difficult.

Of course, the best measure of values of player contracts would be market prices at which contracts exchange. Data on sales prices of individual player contracts are virtually non-existent for any of the major sports leagues. Furthermore, in particular the NFL has the peculiar characteristic that apparently no cash sales of player contracts occur, a fact that is difficult to explain in purely economic terms, since there is no NFL rule outlawing such sales. The absence of data on sales prices of player contracts adds to the ambiguity on valuation of the intangible assets of a team. In fact, when a dispute arises between the IRS and a team concerning the proper value to assign to player contracts, the allowable figure is apparently arrived at by a series of compromises. Okner (3) reports that for most teams, between 70 and 90 percent of the purchase price is allocated to player contracts.

We next turn to the model of valuation of a sports team.

DISCOUNTED PRESENT VALUE OF A SPORTS TEAM

Let P = the price of a sports team,

C = the value assigned to the player contracts held by the team,

F = the value assigned to the "franchise," that is, to the non-depreciable intangible assets of the team together with the tangible assets of team.

Hence, $P = C + F$.

It is assumed that the team will be operated as a "Subchapter S" corporation, a common practice in professional sports. Subchapter S corporations have the characteristic that corporate income may be mixed with the income of the owner of the corporation for tax purposes, while maintaining limited liability so far as the creditors of the corporation are concerned.

Let R_t = net revenue before taxes for the team in year t ,
 α = marginal tax rate of the owner of the team,
 T = period over which player contracts are depreciated,
 S = sales price of the team at the time the new owner disposes of the team.

I. Ownership in Perpetuity

Consider first the case where the new owner buys the team at time zero, intending to hold it in perpetuity. The discounted present value DPV of after tax income from ownership of the team at time zero is given by the following expression.

$$DPV = \sum_{t=1}^T \frac{R_t - \alpha(R_t - C/T)}{\prod_{j=1}^t (1 + d_j)} + \sum_{t=T+1}^{\infty} \frac{R_t(1 - \alpha)}{\prod_{j=1}^t (1 + d_j)}$$

where d_j , $j = 1, 2, \dots$, is the discount rate appropriate for year j .

The formula may be interpreted as follows. IRS rules specify that only straight line depreciation can be applied to depreciable intangible assets -- accelerated depreciation is not permitted. Hence C/T represents annual depreciation of playing contracts during the first T years of ownership. $R_t - C/T$ is then income of the team subject to taxes, and $R_t - \alpha(R_t - C/T)$ is income after taxes, for $t = 1, 2, \dots, T$. Once the playing contracts are fully depreciated, then income after taxes from the team is simply $R_t(1 - \alpha)$. This holds for $t = T + 1, \dots$.

Certain comments are in order concerning the DPV formula. First, for the typical sports team, $R_t - C/T$ is negative, so that the team shows a book loss on its operations. This means that the owner is able to reduce his taxable income derived from other earnings by this book loss, and achieves a tax savings of $\alpha(R_t - C/T)$. He is only able

to take advantage of all of this tax savings if his income from other sources is at least $-(R_t - C/T)$. Hence the formula applies in the form shown only for individuals with large amounts of income earned outside sports.

Second, the discount rate d_j is to be interpreted as the maximum after tax rate of return available to the owner for the j th year on investments of riskiness comparable to that of the sports team.

To indicate the importance of the tax writeoffs on the discounted present value of a sports team, consider the case in which net revenue is expected to be constant over time, so that $R_t = R$ for every t , and the discount rates d_j are constant over time, with $d_j = d$ for every j . Let i denote the maximum before tax rate of return on investments comparable in risk to the sports team. Then $d = (1 - \alpha)i$.

The DPV formula can then be solved to obtain

$$DPV = \left\{ R - \alpha(R - C/T) \right\} \left[\frac{1}{d} \left(1 - \frac{1}{(1 + d)^T} \right) \right] + R(1 - \alpha) \left[\frac{1}{d(1 + d)^T} \right]$$

If no depreciation of playing contracts were permitted, then DPV reduces to

$$DPV = \frac{R(1 - \alpha)}{d} = \frac{R}{i}$$

For example, take $\alpha = .7$, the maximum marginal tax rate, with $i = .33$, so that $d = .10$. Assume that $T = 5$ and that $C = \$8,450,000$.*

* Okner (3) points out that for most sports teams, contracts are depreciated over a period of from 5 to 7 years. The authors have examined the records of three teams, with writeoff periods of 5-1/4 years (football), 3-3/4 years (basketball) and 4 years (baseball). Hence $T = 5$ is a reasonable writeoff period. Further, the tax benefits from ownership are so important that only the rare owner will not be in the maximum tax bracket.

DPV when no depreciation occurs is \$3,000,000, and DPV is \$7,483,000 when depreciation occurs. The cash flows for these two cases are the following.

Cash Flows

with depreciation of \$8,450,000 of player contracts				without depreciation of player contracts		
Year	Income	Taxes	Cash Flow	Income	Taxes	Cash Flow
1	\$1,000,000	-\$483,000	\$1,483,000	\$1,000,000	\$700,000	\$300,000
2	1,000,000	-483,000	1,483,000	1,000,000	700,000	300,000
3	1,000,000	-483,000	1,483,000	1,000,000	700,000	300,000
4	1,000,000	-483,000	1,483,000	1,000,000	700,000	300,000
5	1,000,000	-483,000	1,483,000	1,000,000	700,000	300,000
6 ff.	1,000,000	700,000	300,000	1,000,000	700,000	300,000

Depreciation of the player contracts permits the owner to increase his cash flow from ownership of the team by \$1,183,000 per year for each of the first five years of ownership. Discounted back to the present at 10 percent, this accounts for the \$4,483,000 increase in DPV over the situation in which no depreciation is permitted. Note that the existence or non-existence of the depreciation allowance has no effect on the net revenue (income) of the team, since costs of actually replacing players are identical in either case.

Now admittedly, we have considered a very special case thus far in the sense that the owner is assumed to hold the team forever, hence he is never subject to capital gains tax when the team is sold. We next generalize the model to consider this complication.

II. Ownership and Later Sale of a Team

Assume that the team is held for T^* years, at which time it is sold for a price of S dollars. The appropriate DPV formula becomes

$$DPV = \sum_{t=1}^{T^*} \frac{R_t - \alpha(R_t - C/T)}{\prod_{j=1}^t (1 + d_j)} + \frac{S - .36 \left[S - \left(P - \frac{T^*}{T} C \right) \right]}{\prod_{j=1}^{T^*} (1 + d_j)}$$

for $T^* \leq T$

$$DPV = \sum_{t=1}^{T^*} \frac{R_t - \alpha(R_t - C/T)}{\prod_{j=1}^t (1 + d_j)} + \sum_{t=T^*+1}^T \frac{R_t(1 - \alpha)}{\prod_{j=1}^t (1 + d_j)} + \frac{S - .36[S - (P - C)]}{\prod_{j=1}^{T^*} (1 + d_j)}$$

for $T^* > T$

In the above formulation, the capital gains tax rate is taken to be .36. Okner (3) indicates that the effective capital gains tax rate will range between .32 and .36 for individuals engaged in selling sports teams, so that the formulas assume the upper limit so far as capital gains taxes are concerned. In addition, it is assumed that there is no recapture of excess depreciation, either because of the value assigned to player contracts at time of sale, or because all the playing contracts involved in the original purchase of the club have since been disposed of, and replacement players were signed without bonuses.

DPV is shown both for the case where the team is sold before the player contracts are completely depreciated and for the case where the contracts are completely written off before time of sale. The only new element introduced into the DPV calculation is the sale of the team and the consequent truncation of the flow of cash from ownership of the team.

At time of sale T^* , the owner receives S dollars and pays capital gains taxes, at an assumed 36 percent rate, on the difference between the sales price S and the cost basis of the team. That cost basis ("book value") in turn is equal to the original purchase price P less accumulated depreciation of player contracts, namely $C(T^*/T)$ for $T^* \leq T$, or C if $T^* > T$.

THE VALUE OF A SPORTS TEAM

The economist's theory of asset values argues that assets should sell for their discounted present values. However, this presumes that an asset is purchased only for the time stream of income that the asset provides. In the case of a sports team, there are other factors at work. For certain owners, heading a sports team is viewed as a consumer good in and of itself; for others, the publicity and prestige associated with ownership is of importance. We should expect then that the market price of a sports team will exceed the discounted present value of the after tax income generated by the team. Unfortunately, there is no obvious way of incorporating this non-financial aspect of ownership into the valuation of a team. The approach that will be taken here is to ignore such non-financial matters and as a first approximation assume that the team in fact sells on the basis of DPV; it is then possible to make comparisons between such calculated values and actual market prices of teams to arrive at some idea as to the importance of the non-financial aspects of ownership.

But even when we restrict ourselves to DPV as a measure of the value of a team, it is obvious from the above formulas that DPV itself will vary depending on the time that the team is sold. We will in fact consider in detail two extreme cases: (1) the case where the team is held in perpetuity by the owner ($T^* = \infty$); (2) the case where the team is sold as soon as the tax advantages of ownership are exhausted ($T^* = T$).

There is one further qualification to the rule of equating DPV with price that should be noted. One alternative that is always available to a team owner (except perhaps in the NFL) is to sell the player contracts owned by the team to the other teams in the league. Hence the price of a team can never be less than the market value of such contracts. In fact, more generally, the allocation of the purchase price to player contracts C must itself always be at least as large as the market value of the contracts, since such an allocation presumably can always be justified to the IRS. Let M denote the market value of the player contracts, and let a , $0 \leq a \leq 1$, denote the fraction of the purchase price that is allocated to player contracts. Then $P \geq M$; in fact, $C = aP \geq M$. (Note that a is not necessarily a constant; instead, a might well be a function of P or of M .)

Turning first to the case of ownership in perpetuity, equating DPV to P , subject to the qualifications noted, gives

$$P = \sum_{t=1}^T \frac{R_t - a \left(R_t - \frac{aP}{T} \right)}{\prod_{j=1}^t (1 + d_j)} + \sum_{t=T+1}^{\infty} \frac{R_t(1 - a)}{\prod_{j=1}^t (1 + d_j)}$$

Solving for P , we obtain

$$P = \frac{1}{1 - \frac{aa}{T} \left(\sum_{t=1}^T \frac{1}{\prod_{j=1}^t (1 + d_j)} \right)} \left(\sum_{t=1}^{\infty} \frac{R_t(1 - a)}{\prod_{j=1}^t (1 + d_j)} \right)$$

In the special case where $d_j = d$ for all j and $R_t = R$ for all t , the formula reduces to

$$P = \left[\frac{1}{1 - \frac{aa}{Td} \left(1 - \frac{1}{(1+d)^T} \right)} \right] \frac{R(1-a)}{d}$$

Assume that $d = .1$, $a = .7$, $R = \$1,000,000$ and $T = 5$, as in the earlier example. The table below shows the dependence of P on a , that is, on the fraction of the purchase price that is allocated to player contracts.

a	P	a	P
0	\$3,000,000	.5	\$4,084,200
.1	3,168,000	.6	4,402,500
.2	3,356,400	.7	4,774,500
.3	3,568,200	.8	5,215,500
.4	3,808,800	.9	5,745,900

To illustrate why the value of the team increases as a increases, consider the cash flows associated with a few values of a .

$a = 0$, $P = \$3,000,000$, $C = 0$

	Net Revenue/Year	Taxes/Year	Cash Flow/Year
Years 1 - 5	\$1,000,000	\$700,000	\$300,000
Years 6 ff.	\$1,000,000	\$700,000	\$300,000

$a = .5$, $P = \$4,084,200$, $C = \$2,042,100$

	Net Revenue/Year	Taxes/Year	Cash Flow/Year
Years 1 - 5	\$1,000,000	\$414,100	\$585,900
Years 6 ff.	\$1,000,000	\$700,000	\$300,000

$a = .9$, $P = \$5,745,900$, $C = \$5,171,400$

	Net Revenue/Year	Taxes/Year	Cash Flow/Year
Years 1 - 5	\$1,000,000	-\$24,000	\$1,024,000
Years 6 ff.	\$1,000,000	\$700,000	\$300,000

The \$724,000 additional cash flow per year (for the first five years) when discounted back to the present, accounts for the \$2,745,900 increase in value of the team when a is increased from 0 percent to 90 percent, assuming the team is owned in perpetuity. This represents an increase in value of some 92 percent, due solely to the special tax advantages associated with player contract writeoffs.

The situation is even more pronounced when we turn to the case where the team is sold at the time the tax advantages are exhausted. Setting $C = aP$, the formula for P becomes

$$P = \frac{\sum_{t=1}^T R_t - a \left(R_t - \frac{aP}{T} \right)}{\sum_{j=1}^T \frac{t}{\prod (1+d_j)}} + \frac{S - .36[S - (P - aP)]}{\sum_{j=1}^T \frac{1}{\prod (1+d_j)}}$$

Solving for P , we have

$$P = \frac{1}{1 - \frac{aa}{T} \left(\sum_{t=1}^T \frac{1}{\prod_{j=1}^T (1+d_j)} \right) - \frac{.36(1-a)}{\sum_{j=1}^T \frac{1}{\prod_{j=1}^T (1+d_j)}}} \left(\sum_{t=1}^T \frac{R_t(1-a)}{\prod_{j=1}^T (1+d_j)} + \frac{.64S}{\sum_{j=1}^T \frac{1}{\prod_{j=1}^T (1+d_j)}} \right)$$

In particular, consider the special case where net revenues and discount rates are constant over time so that $R_t = R$ for every t and $d_j = d$ for every j . Then the ungainly formula above reduces to

$$P = \frac{1}{1 - \frac{aa}{Td} \left(1 - \frac{1}{(1+d)^T} \right) - \frac{.36(1-a)}{(1+d)^T}} \left\{ \sum_{t=1}^T \frac{R(1-a)}{(1+d)^t} + \frac{.64S}{(1+d)^T} \right\}$$

The sales value S is the complicating factor in this expression. Presumably S will be equal to the DPV of the time stream of income beginning in year $T + 1$; but this in turn depends on the time at which that new owner sells, what sales price he can obtain, and the new owner's marginal tax bracket. The simplest case to consider is one in which each succeeding owner holds the team for T years, and has the same marginal tax rate a , so that $S = P$. This permits a further simplification of the expression for P to the following

$$P = \frac{R(1-a)[(1+d)^T - 1]}{d \left\{ (1+d)^T \left(1 - \frac{aa}{Td} \right) + \frac{aa}{Td} - 1 + .36a \right\}}$$

To return to our overworked example, let $d = .1$, $a = .7$, $R = \$1,000,000$ and $T = 5$. The table below gives the relationship between P and a .

a	P	a	P
0	\$3,000,000	.5	\$5,041,300
.1	3,264,300	.6	5,835,400
.2	3,579,800	.7	6,926,500
.3	3,962,700	.8	8,519,500
.4	4,437,400	.9	11,064,000

Cash flows associated with various values of a are the following.

$$a = 0, P = \$3,000,000, C = 0$$

	<u>Net Revenue/Year</u>	<u>Taxes/Year</u>	<u>Cash Flow/Year</u>
Years 1 - 5	\$1,000,000	\$700,000	\$300,000
Sale in year 5	---	---	---

$$a = .5, P = \$5,041,300, C = \$2,520,650$$

	<u>Net Revenue/Year</u>	<u>Taxes/Year</u>	<u>Cash Flow/Year</u>
Years 1 - 5	\$1,000,000	\$347,100	\$652,900
Sale in year 5	---	\$907,434	-\$907,434

$$a = .9, P = \$11,064,000, C = \$9,957,600$$

	<u>Net Revenue/Year</u>	<u>Taxes/Year</u>	<u>Cash Flow/Year</u>
Years 1 - 5	\$1,000,000	-\$394,050	\$1,394,050
Sale in year 5	---	\$3,584,736	-\$3,584,736

With $a = 0$, sale of the team for \$3,000,000 in year 5 involves no capital gains taxes, so that the owner instead receives \$300,000 after taxes per year, giving him a 10 percent return on his investment. With $a = .9$, the value of the team increases \$8,064,000, since with depreciation of player contracts, there is an increase in cash flow per year during the period of ownership by over \$1 million. A part of this is recovered in the \$3,584,736 of capital gains taxes at time of sale, of course. But the fact that tax savings are available to each successive owner, operating the team for T years, boosts the price of the team to \$11,064,000.

The assumption that the team can be sold in T years at the current price, under stationary revenues and discount rates, unquestionably overstates the value of the team. Certainly there will be a higher riskiness associated with the sales price than with net revenue, since that sales price depends in turn on expectations into the more distant future. Hence

it undoubtedly would be more realistic to associate a higher discount rate with the expected sales price than that shown in order to reflect this higher riskiness. We will not make that adjustment here, and instead will regard the expression above relating P to the various parameters of the valuation process, as an upper bound on the market price, assuming stationary revenues and discount rates, and of course ignoring the non-financial payoffs from team ownership.*

* The importance of the assumption that no recapture of excess depreciation occurs should also be emphasized. If all excess depreciation were in fact captured, then the formula for P in the resale case becomes

$$P = \frac{R(1 - a)[(1 + d)^T - 1]}{d \left\{ (1 + d)^T \left(1 - \frac{aa}{dT} \right) + \frac{aa}{dT} - 1 + aa \right\}}$$

(the last term in the denominator changes from .36a to aa when recapture occurs). For $a = .7$, $a = .9$, $T = 5$, $R = \$1,000,000$, the value of the team is \$3,880,000 with complete recapture versus \$11,064,000 when there is no recapture. In effect, with complete recapture the only gain to the owner is the interest earned by delaying his tax payments T years into the future, that is, until the time when sale of the team takes place.

What can be concluded from this exercise? First, the importance of the tax advantage involved in the depreciating of player contracts on the value of a team is quite apparent, whether a team sells on the basis of ownership in perpetuity or on the basis of resale once the tax advantages are exhausted. The quantitative magnitudes are of course quite sensitive to the parameter values chosen. But under "reasonable" choices for those parameter values, as in the examples, a team is worth almost twice as much to an owner buying for holding in perpetuity when he can assign 90 percent of the purchase price to contracts than when no depreciation is permitted. And the team is worth 3-2/3 times as much in the "upper bound" resale case. Second, these results become even more striking the lower is the

discount rate and the shorter is the time period over which contracts are depreciated, as is clear from the formulas.

One point should be emphasized. It is not being argued here that tax advantages from ownership provide bonanzas for high income individuals who buy sports teams. In fact, the approach of this paper is one in which all such advantages are assumed to be capitalized into the prices at which sports teams are sold. If wealthy individuals can earn 10 percent (after taxes) in investments in other industries, it is assumed that what they will earn in sports is 10 percent (after taxes) as well. The gains from the tax advantage accrue instead to those owners who bought in before the tax advantages existed or before the

advantages were widely enough recognized so that they were capitalized in the prices of teams. And gains also accrue to existing owners in a sports league when expansion franchises are created and sold; such existing owners share equally in expansion fees which in turn presumably are set at levels that reflect the tax advantages of ownership.

A comment is in order concerning the discount rate(s) appropriate for investment in a professional sports team. A rate of return (after taxes) of 10 percent might seem high, given that an individual in the 70 percent tax bracket would have to earn 33 percent before taxes in order to make 10 percent after taxes, in the absence of special tax advantages. But a sports team must be regarded as a highly risky investment -- in part because income depends on monopoly control of the sport, since emergence of competitive leagues can erode profitability quite rapidly, as in the case of the ABA and WHA, by transferring rents from owners to players. Sports is a risky investment as well because the value of a sports team rests in large part on an administrative ruling from the IRS which is subject to somewhat unpredictable changes. For this last reason in particular the discount rate appropriate for sports teams is certainly higher than the variability of net revenue from changes in attendance and costs might indicate.

QUALIFICATIONS TO THE DPV FORMULAS

Finally, some comments are in order concerning the purely mathematical properties of the formulas derived above for P , both in the case of holding in perpetuity and in the case where resale takes place after the tax advantages are exhausted. Strictly speaking these formulas hold under stationary conditions only when $R \geq 0$; when there is sufficient outside income so that the book losses of the team can be applied in total to other taxable income of the owner; and when P , as calculated, satisfies $aP \geq M$; and when there is no recapture of excess

depreciation. But there is the further issue of whether the operation of solving for P involves a mathematical absurdity. Consider first the case of ownership in perpetuity, where

$$P = \frac{1}{1 - \frac{aa}{dT} \left(1 - \frac{1}{(1+d)^T} \right)} \frac{R(1-a)}{d}$$

Let $f(d) = 1 - \frac{aa}{dT} \left(1 - \frac{1}{(1+d)^T} \right)$. Then the expression for P holds

only if $f(d) > 0$. To see that this condition is in fact satisfied, note that

$$\begin{aligned} f'(d) &= -\frac{aa}{T} \left[\left(1 - \frac{1}{(1+d)^T} \right) \left(-\frac{1}{d^2} \right) + \frac{1}{d} \left(\frac{T(1+d)^{T-1}}{(1+d)^{2T}} \right) \right] \\ &= -\frac{aa}{dT} \left[\frac{1}{d} + \frac{1}{d(1+d)^T} + \frac{T}{(1+d)^{T+1}} \right] \\ &= -\frac{aa}{d^2 T} \left[-1 + \frac{1 + (T+1)d}{(1+d)^{T+1}} \right] \end{aligned}$$

Since $(1+d)^{T+1} = 1 + (T+1)d + \text{other positive terms}$, the expression in brackets is negative, hence $f'(d) > 0$ for $d > 0$.

Further, by L'Hospital's rule,

$$\lim_{d \rightarrow 0} \frac{1}{dT} \left(1 - \frac{1}{(1+d)^T} \right) = \frac{\frac{T(1+d)^{T-1}}{(1+d)^{2T}}}{T} = \frac{1}{(1+d)^{T+1}} = 1$$

Consequently,

$$\lim_{d \rightarrow 0} 1 - \frac{\alpha a}{dT} \left(1 - \frac{1}{(1+d)^T} \right) > 0$$

since $0 \leq \alpha < 1$, $0 \leq a \leq 1$. Hence $f(d) > 0$ for $d > 0$.

The interpretation to be given to this result is that if a team is to be held in perpetuity after purchase, and if, under stationary conditions, $R \leq 0$, then any purchase price above the market value of the player contracts held by the team can be justified only by the non-financial payoffs associated with ownership of the team.

The situation is more complicated when the team is purchased for resale after the tax advantages are exhausted. Under stationary conditions, and assuming the selling price $S = P$, the original purchase price, the expression for P is given by

$$P = g(d)R(1 - \alpha)$$

where

$$g(d) = \frac{(1+d)^T - 1}{(1+d)^T \left(d - \frac{\alpha a}{T} \right) + \frac{\alpha a}{T} - d + .36ad}$$

Then

$$\lim_{d \rightarrow 0} g(d) = \frac{T}{(.36 - \alpha)a} \leq 0 \quad \text{for } \alpha \geq .36$$

Thus for sufficiently low values of d , $g(d) \leq 0$ so long as the ordinary income tax rate is at least as high as the capital gains tax, which is always the case of course. When $g(d) \leq 0$ then the formula

relating P to R can be interpreted as follows.

If $R \geq 0$, then any prospective owner would be willing to pay any positive price P for the team, P being limited only by the availability of outside income against which the book losses of the team could be used to reduce the owner's tax liability.

If $R \leq 0$, then for any given positive P , the formula permits one to calculate the largest loss such that the owner still earns d percent or more on his investment.

To illustrate, suppose $d = .1$, $\alpha = .7$, $T = 1$. Then

$$g(d) = \frac{.1}{(1.1)(.1 - .7a) + .7a - .1 + .036a} = \frac{.1}{.01 - .034a}$$

Hence $g(d) \leq 0$ for $a \geq \frac{10}{34}$.

In particular, take $a = .5$. Suppose $R = 0$. Then at any price P , the cash flow of the owner is given by

	<u>Net Revenue</u>	<u>Taxes</u>	<u>Cash Flow</u>
Year 1	0	-.35P	+.35P
Sale at end of year 1	---	.18P	-.18P

Thus for any price P , the owner earns 17 percent on his purchase price, hence with $d = 10$ percent, he is willing to invest any amount in the team, up to the limits imposed by his outside income available for tax shelter.

If the owner pays \$1,000,000 for the team, given the same values for d , α , T and a , then this price is consistent with a ten percent rate of return if the loss of the team is \$233,333 as illustrated below.

	<u>Net Revenue</u>	<u>Taxes</u>	<u>Cash Flow</u>
Year 1	-\$233,333	-\$513,333	+\$280,000
Sale at end of year 1	---	\$180,000	-\$180,000

Thus the team yields a cash flow of \$100,000 or a 10 percent rate of return. For smaller losses, the rate of return exceeds 10 percent of course.

Admittedly, the case $g(d) \leq 0$ must be regarded as somewhat exceptional. For $d = .1$, $\alpha = .7$, $a = .9$, then $g(d) \leq 0$ only if $T \leq 3$. Nonetheless it is not precluded as a possibility, and when this case occurs, even teams promising large losses over the future become profitable investments for sufficiently wealthy individuals, assuming that such individuals can unload the teams at original purchase prices once the tax advantages are exhausted.

DATA ON VALUES OF FRANCHISES

In a recent study (1) the authors compiled a history of franchise prices for the major professional sports leagues. Data used in the study came mainly from published reports in the New York Times and Sporting News, supplemented by contacts with teams and leagues. Because sports teams typically are closely held corporations, data on financial operations (including the prices at which teams are sold) are somewhat suspect, being based on the educated guesses of sportswriters. For many transactions, no values could be obtained. Finally, even when dollar amounts are known to be accurate, the terms under which payment is to be made are often not known, and such terms can have an important effect on the cash equivalent prices of franchises. With these qualifications, the following table summarizes franchise values for the four major professional team sports over the recent past.

Franchise Values, 1950-1974*

(Thousands of Dollars)

	1950- 1954	1955- 1959	1960- 1964	1965- 1969	1970- 1974
<u>Basketball (NBA)</u>					
Average Sales Price	---	(2) \$187.5	(2) \$975	(3) \$3,867	(3) \$4,900
Average Expansion Price	---	---	---	(5) \$1,820	(4) \$4,313
<u>Baseball</u>					
Average Sales Price	(6) \$2,957	(3) \$4,820	(4) \$6,984	(3) \$8,617	(5) \$10,358
Average Expansion Price	---	---	(4) \$2,201	(4) \$7,788	---
<u>Football (NFL-AFL)</u>					
Average Sales Price	(1) \$600	---	(5) \$3,632	(3) \$13,555	(2) \$19,000
Average Expansion Price	---	---	(2) \$600	(4) \$7,938	(2) \$16,000

(Numbers in parentheses refer to the number of observations in the given time period.)

Source: Davis, L. and Quirk, J., "The Ownership and Valuation of Sports Franchises," mimeo. (California Institute of Technology, 1974).

* Hockey has been excluded from the table due to inadequate data.

By way of contrast, scattered data on net income before taxes of sports teams are shown below.

Net Income before Taxes (Excluding Contract Writeoffs)
per Team, Selected Years

	Avg. per year 1952-56*	Noll estimates**	
Basketball (NBA)	-\$2,000	-\$31,000	(1971)
Baseball (AL-NL)	+\$137,000	+\$273,000	(1969)
AL	+\$194,600	n. a.	
NL	+\$79,100	n. a.	
Football (NFL)	+\$69,000	+\$1,420,000	(1970)

* Organized Professional Team Sports, House Committee on the Judiciary (1957).

** Government and the Sports Business, R. Noll, editor (Brookings, 1974). Estimates shown are for "average" teams.

The most striking feature of the data on team values is the rapid rate of increase in such values in all three sports, both for established teams and for expansion teams. At least so far as established teams are concerned, the rise in team values reflects in part the fact that in the early years of the table, teams losing money tended to be sold more often than profitable teams. But of overriding importance, of course, is the increase in public interest in professional sports as reflected in higher attendance and TV revenues in all sports. Beyond this, from 1960 on, the special tax advantages discussed above became available to owners.

The profit data offer an interesting contrast to the data on team values. Except perhaps for the case of football, profits do not

show the increases that would generate the rapid rises in team prices shown in the first table. Hence it must be concluded that other factors are at work in inflating the values of sports teams. The most obvious candidates are (1) an increase in the prestige value of ownership of a sports team; (2) the change in the tax status of team ownership; (3) a lowering of the discount rate applicable to the earnings of sports teams, due, say, to a decrease in the riskiness of sports as an investment. These three factors are not unrelated, and undoubtedly all have played parts in increasing the prices of sports teams.

Some general comments can be made concerning the current situation relative to team values in the three sports. First, the "average" NBA team is probably bought to be resold. As a financial investment, ownership in perpetuity of a team is only justified at a positive price if earnings (net revenues) are expected to be positive, or if the price just covers the market value of the player contracts. With the average NBA team having negative net revenues, current prices of NBA franchises must reflect either purchase for resale or an important ingredient of prestige value.

In particular, in the 1970 NBA expansion when Buffalo, Portland and Cleveland were admitted to the league, the expansion price was \$3.7 million per team. The terms were \$1.5 million in cash, with \$550,000 paid each year for the next four years. Assuming a discount rate of 8 percent, the cash equivalent value is roughly \$3.32 million. Suppose that a typical expansion franchise will earn the average net revenue of an NBA team of -\$31,000 per year, that $a = .8$, $T = 4$, and $\alpha = .7$. Then the rate of return that equates DPV to the price of \$3.32 million, assuming resale at \$3.32 million when tax advantages are exhausted, can be derived from the formula for P above to obtain $d = .066$. In other words, an expansion franchise expected to perform like an average NBA team would be a good investment for resale in

four years if the best after tax rate of return on assets of comparable riskiness outside of sports was 6.6 percent. Such a low rate of return under the most favorable conditions so far as tax sheltering is concerned seems to indicate a large measure of "prestige" value to ownership of an NBA expansion franchise.

In connection with this, it might be mentioned that of the three sports, the rate of turnover of franchises is greatest in basketball. Since 1960, Atlanta has been sold twice; Baltimore once; Boston three times; Chicago once; Golden States once; Houston twice; Kansas City-Omaha once; Los Angeles once; Philadelphia once.

With net revenue of \$273,000 per year, the "average" baseball team would command a positive price even if bought for holding in perpetuity, as a financial investment. At a 10 percent rate of discount, with $a = .8$, $\alpha = .7$ and $T = 5$, the price for an average baseball team held in perpetuity would be \$1,564,000. In 1967, the last expansion of baseball occurred, with the AL adding Kansas City and Seattle with expansion fees of \$5,300,000 each, while the NL added San Diego and Montreal at \$10,000,000 each. Terms of these sales were not available to the authors, but for concreteness, assume that they were roughly the same as those in the 1970 NBA expansion. At an 8 percent discount rate, the cash equivalent values of the AL and NL expansion teams were \$4.76 million (AL), \$8.97 million (NL). The rate of return for holding in perpetuity that equates the DPV to the average of these prices, assuming expansion teams earn average profits of \$273,000 per year, is approximately 2.1 percent. Clearly either the teams were bought to be resold, or the prestige value of a baseball franchise is high indeed. Under the resale assumption, the rate of return that equates DPV to price is approximately 5.3 percent. Baseball teams sold since 1960 include Atlanta, Chicago White Sox (twice), Cincinnati Reds (twice), Cleveland Indians (twice), Seattle, New York

Yankees (twice), Kansas City Athletics, San Diego, and Washington-Texas (three times).

Finally, there is the real success story, pro football. In 1974, the Tampa and Seattle expansion franchises were sold for \$16 million each. Terms of these sales have not been announced. Again, using the NBA 1970 expansion as a guide, the cash equivalent (at 8 percent discount) is \$14.35 million. Recently, the NFL owners provided a public statement of net revenue per average team which is claimed to be \$945,000 per year, considerably below Noll's estimate. Using the ownership in perpetuity assumption together with a five year writeoff, $\alpha = .7$, $a = .8$, the rate of return to the new owners, assuming they experience average results for the NFL, is 4 percent. If they resell after five years, the rate of return is 8.3 percent, again assuming that the team is resold at the purchase price. Football teams sold since 1960 include the Baltimore Colts, Cleveland Browns, Detroit Lions, Los Angeles Rams, New York Titans-Jets (twice), Philadelphia Eagles (three times), San Diego Chargers.

SUMMARY

Market prices for sports teams clearly are influenced by non-financial factors; the rates of return that can be earned utilizing all tax advantages of ownership still appear to be too low to justify the ownership of a team in any league as a purely financial matter. Nonetheless, those tax advantages are not at all trivial in terms of their impact on returns from ownership of a sports team. Sports teams prices would certainly be affected in a very damaging way if the rules of the IRS were changed either to eliminate the depreciation of playing contracts or to provide for effective recovery of excess depreciation at time of sale of a team. Under the present tax laws, only an individual in the 70 percent tax bracket could reasonably

consider purchase of a team; and if the profit data used in this paper is at all close to the true net revenues of sports teams, the rate of return such a wealthy individual will earn is certainly less than could be earned in less risky tax shelters such as medium grade municipal bonds.

It should be emphasized that the approach of this paper has been very much centered on "steady state" analysis, even though the formulas presented apply as well to changing patterns of revenues and riskiness. This is important, because in the face of the low rates of return after taxes from current operations of sports teams, team prices have continued to climb rapidly over the past twenty-five years. Investors in sports teams have in fact earned high rates of returns on their investments because of this rise in team prices, rather than because of the after tax income from running the teams themselves. Perhaps the appropriate model for explaining rising team prices is more appropriately the model of the various speculative "bubbles" of the eighteenth century rather than the economist's model of asset valuation based on income streams. What can be concluded is that rates of return from operating teams, even including the tax advantages, leave a substantial portion of team valuation unexplained.

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